

Water Allocation Matrix

NEWWA Water Resources Committee¹

05/10/02 Draft

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The purpose of developing this matrix was to see whether problems reported in some states were being found New England-wide, and to help New England Water Works develop fair and reasonable recommendations for water systems, EPA and state regulators to consider.

1. Streamflow Limit Methods

Methods used by regulatory agencies to identify impacted streams and to set allocation limits can be widely variable. Water suppliers should pay close attention to the choice of methods for identifying protected instream flows to assure that good science is used. Some widely used methods, such as Aquatic Base Flow (ABF), are calculated rather than measured. The ABF method is based on many sampled streams in New England, but was not intended to be applied to streams with drainage areas of less than a 50 square miles. This method also requires a minimum of 25 years of gauging for accuracy, and data from nearby gauges on unregulated streams is also not applicable³. Methods that involve field work, such as Instream Flow Incremental Method (IFIM) are more accurate in determining minimum flows needed for fisheries, but still may not account for factors such as water quality and competition for the target species, so their application must be reviewed by knowledgeable fisheries biologists. State contacts were asked whether impacted streams had been identified in their state and if so, whether studies had been done that identified water supply withdrawals as responsible for low flow in these streams.

State	Response
CT	<p><u>Impacted Streams</u>. Streamflow problems have been identified through Sections 303(d) and 305(b) of the Federal Clean Water Act and through CT General Statutes 26-141A-1 Minimum Streamflow Standards. Streamflow problems can be attributed to many consumptive withdrawals, not just water supply.</p> <p><u>Instream Flow Limit Methodologies</u>. There is no statewide standard. Applicant selects method and the state makes a determination whether it is applicable.</p>
MA	<p><u>Impacted Streams</u>. The Water Resources Committee (WRC) of the Executive Office of Environmental Affairs (EOEA) has done a study to identify “Stressed River Basins (sub-basins) in Massachusetts. Two streams with severe water quality problems as a result of low stream flows are the Ipswich River and the Upper Charles River. The USGS has done modeling studies of the Ipswich River and identified groundwater withdrawals as a major contributor to low flows. The USGS has also modeled the Upper Charles River and related low stream flow to imperviousness as well as water supply withdrawals that result in wastewater discharges that degrade the stream. In the 1980s the USGS modeled the Elm Bank area in Natick and showed that future water supply withdrawals would impact the stream flow in the Charles River.</p> <p><u>Instream Flow Limit Methodologies</u>. The DEP uses the 7Q10 and the median August flows for the early screening of proposed water supply withdrawals. Later analyses utilize several methodologies including ABF, R2Cross, Wetted Perimeter and</p>

¹ This matrix is part of a working document and has not been submitted or approved by the New England Water Works Board of Directors. Also, all Water Resources Committee members may not have reviewed this draft version.

² The “state contributors” whose opinions and information is reflected in this matrix assessment may only be representing their own views of the situation. In some states, there are varying viewpoints of the status of various regulations and programs because of the involvement of multiple state agencies that may not be fully reflected in this matrix. In some cases, water systems have noted to the Committee that they do not agree with the state’s assessment of the issues. Nonetheless, the Committee felt that these responses were a good beginning point for further discussions and refinements. The information in this matrix was used, in part, to develop the accompanying recommendations paper.

³ Iano, Vernon. “Questions and Answers on the New England Flow Policy.” U.S. Fish & Wildlife Service. May 11, 1999.

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	Tennant methods. The results are compared, the compatibility of the stream with conditions for the original development of the models is made, and DEP chooses the most appropriate methodology for the specific stream. ⁴
NH	<p><u>Impacted Streams</u>. Several streams have been identified in the complaints database of the Watershed Management Bureau (WMB) based on visual observations such as complete capture of flow by diversion dams for water supplies. These are considered complaints, and not yet verified, but complete loss of river flow has been described. So far, the WMB has assessed average flows versus average withdrawal rates for impacts on the thirteen existing Designated Rivers and the Isinglass, a proposed Designated River. The proposed ISF Rules are intended to address the highest use reaches, but for the time being the plan is to pilot the rules process on two of the eight existing priority reaches. Scientific assessment of uses, flow needs, etc., are to be done. See January 8, 2002 version of the proposed rules.</p> <p><u>Instream Flow Limit Methodologies</u>. The UNH/Durham water system is operating under a withdrawal scheme tied to river flows. Loon Mountain is using FMF as the basis for withdrawals for snowmaking. Several water quality certifications have restrictions tied to flow. ABF tends to be the default method in these cases, except in the case of Durham. What's proposed under the ISF Rules is a basin-by-basin approach using site-specific studies similar to a MESO HABSIM or Target Fish Community studies, but not limited to any one methodology. Comparison of results by more than one method is possible. The choice of methodology for current management, ABF, is considered a locally developed, and well-established method.</p>
ME	<p><u>Impacted Streams</u>. Some impaired rivers have been identified pursuant to the 303(d) list but there is no formal identification or assessment process in place. Most impacted water bodies are due to agricultural withdrawals but again, no formal studies have been performed.</p> <p><u>Instream Flow Limit Methodologies</u>. LURC has no established standards for minimum stream flows, and a variety of sources of information have been used to establish standards. Minimum stream flow standards have been established on a case-by-case basis. All of the following have been used at one time or another by LURC as a basis for permit conditions establishing minimum flows: a) Instream flow studies on the Pleasant and Narraguagus Rivers, and Mopang Stream (Machias River watershed) for some irrigation sites within these salmon watersheds in Washington County; b) historical stream gauge data if there is, or has been, a USGS gauge on the river or stream; c) site specific data if available, (In some cases permit conditions in later years have been modified based upon site specific flow data collected by the applicant in previous years.); d) where there are no watershed studies, no historical stream gauge information, and no site specific data, LURC has sometimes used USFWS New England standard of 0.5 cfs/m to estimate August median flows.</p>

⁴ Different methods were used to calculate the mean August flow, including FWS method. ABF is a standard setting instream flow method. It is not intended to be a simply hydrologic statistic to be computed using median daily values. The USGS study analyzed mostly gauging records which FWS did not include either because the drainage area was not 50 square miles, the period of record was not at least 25 years or the stream or river was excessively regulated.

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RI	<p><u>Impacted Streams</u>. One watershed area has been noted as at its limitation but not beyond its limitation. Some streamflow problems have been identified, but not large degrees of degradation, with many becoming better. Obviously, the non-point sources remain the largest problem.</p> <p><u>Instream Flow Limit Methodologies</u>. The WRB is using 7Q10 as a control on its studies and models developed with USGS. Other groups preferred both higher and lower control setting. The WRB, after listening to all parties, chose its methods with consultation of the RI USGS office.</p>
VT	<p><u>Impacted Streams</u>. Vermont has reported several impacted streams.</p> <p><u>Instream Flow Limit Methodologies</u>. In the Vermont snowmaking and instream flow policies 0.8 cfs/m is used rather than 1.0 cfs/m for FMF. The lower number is based solely on an analysis of Vermont gauges, not New England wide. Elsewhere VT used 0.5 cfs/m and 4.0 cfs/m as defaults for the Summer and Spring.</p>
<h2 style="text-align: center;">2. Other Demands and Losses</h2>	
<p>Competition for increasingly scarce water supplies has dramatically increased in New England in the last 20 years. Water supplies have been threatened with contamination, loss of recharge (from impervious surfaces that increase runoff), loss of groundwater via sewer pipes that leak inward, and skyrocketing summer demands from large houses with massive lawns and irrigation systems. This reduced supply also faces competition from agricultural withdrawals and golf courses, industrial withdrawals, and most recently water bottlers. We asked state contacts whether they regulated these factors.</p>	
CT	<p><u>Industrial Withdrawals</u>. Industrial withdrawals are subject to Water Diversion Policy Act. During the permitting process the effect on existing water uses is evaluated along with the cumulative effect of all withdrawals.</p> <p><u>Water bottlers</u>. No bottlers have applied. Only bottlers are customers of water companies and they are regulated by the DPH.</p> <p><u>Agricultural Withdrawals</u>. Agricultural/golf withdrawals - same as all other withdrawals. No numbers available although they are significantly increasing.</p> <p><u>Sewer</u>. All sewerage needs to be consistent with the State Plan of Conservation and Development.</p>
MA	<p><u>Industrial Withdrawals</u>. The WMA applies to any industrial user of 100,000 or more gallons per day, although the source approval process is not applicable. These withdrawals can occur within wellhead or outside service area unless the withdrawal has a detrimental impact on the public water supply.</p> <p><u>Water bottlers</u>. The DEP approves withdrawals by bottlers with respect to source development, then the Department of Public Health (DPH) assumes control. The major problem for bottlers is the requirement to own/control the eleven and one-half acres for Zone I. A memo of understanding exists between DEP and DPH.</p> <p><u>Agricultural Withdrawals</u>. Any withdrawal greater than 100,000 gallons per day is regulated. None have been denied, with 15-20 being permitted in the last 5 years.</p> <p><u>Sewer</u>. The Interbasin Transfer Act regulates the export of water out of the donor watershed.</p> <p><u>Stormwater</u>. DEP has a stormwater policy that encourages recharge, indirectly, by regulating stormwater discharges in wetlands areas. The area of influence is limited to wetlands and wetlands buffers (100 ft).</p>

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ME	<p><u>Industrial Withdrawals</u>. Besides the LURC, which has jurisdiction over unorganized territories, DEP administers the Maine Site Location Law which can regulate the amount of water withdrawn if the project results in an impervious area greater than 3 acres in size. The size of the impervious area is the only trigger, so industrial withdrawals can occur anywhere.</p> <p><u>Water bottlers</u>. Bottlers are regulated through the Site Location Law and bulk water transport permits. There are approximately 6 permits in effect. There have been no permits denied in the last 5 years.</p> <p><u>Agricultural Withdrawals</u>. New golf courses, provided they have >3 acres of impervious area, are regulated under the Site Location Law.</p> <p><u>Sewer</u>. State doesn't regulate/discourage sewer export. They have adopted the federal Phase I regulations which do not specifically address aquifer recharge.</p>
NH	<p><u>Industrial Withdrawals</u>. New industrial groundwater withdrawals that exceed 57,600 gallons over any 24-hour period must obtain a large groundwater withdrawal permit. Wetlands permits and discharge permits are required for surface withdrawals. These withdrawals can occur within wellhead protection areas or service areas, but new industrial groundwater withdrawals that exceed 57,600 gallons over any 24-hour period must demonstrate that they are not adversely impacting existing water users or environmental resources.</p> <p><u>Water bottlers</u>. Large Groundwater Withdrawal Permit required if > 57,600 gpd. None denied since program began in 1998, but none have been granted yet. One is under consideration. Department of Health and Human Services also regulates bottlers.</p> <p><u>Agricultural Withdrawals</u>. Agricultural/golf course withdrawals require a large groundwater withdrawal permit for all withdrawals that exceed 57,600 gallons over any 24-hour period. Three applications have been received, two permits with numerous conditions were issued.</p> <p><u>Sewer</u>. State doesn't regulate/discourage sewer export.</p> <p><u>Stormwater</u>. Regulations do not address imperviousness of aquifers or promote recharge specifically, but the state has issued guidance encouraging municipalities to require the infiltration of treated stormwater where appropriate.</p>
RI	<p><u>Industrial Withdrawals</u>. Industrial withdrawals have never been regulated (water rights controlled) but will be part of the process developed when WRB develops its authority. Would be reviewed locally first and then through the WSSMP program as well as the DEM Wellhead Protection Program.</p> <p><u>Agricultural Withdrawals</u>. Agricultural/golf withdrawals not regulated but all cooperate with state entities, local watershed groups and each other out of an abundance of good management practices for the good of all. Will be part of the WRB process when developed.</p> <p><u>Sewer</u>. DEM has authority; but do not think this takes place.</p>
VT	<p><u>Stormwater</u>. The state is evaluating methods to encourage communities to use Runoff Prevention Methods that encourage recharge.</p>

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3. Allocation Priority

Allocation priority refers to what demands are given priority when a stream is impacted and has limited flow available. State contacts were asked how they regulate withdrawals and if there was any type of priority system.

CT	Regulatory supported by State planning. Water Diversion Policy Act (CGS 22a-368) requires a permit for all withdrawals >50,000 gpd. Diversion process is first come, first serve although in the recently submitted Report to the General Assembly on State Water Allocation Policies Pursuant to Public Act 98-224 (referred to as "Diversion 2000 Report") the establishment of a priority of withdrawals was recommended.
MA	The Site Screening is policy based. The follow-on Water Management Act (WMA) requirements are regulatory. Site Screening is utilized to identify up-front those situations that appear to be incompatible with additional withdrawals from a stream, thus preventing a water utility from spending large amounts of money only to be denied withdrawals. The WMA addresses numerous criteria included conservation requirements, emergency declaration policy, and permitting. In Massachusetts, public health issues are always Number 1, then all other considerations are equal.
ME	There is no allocation program, this gets into the interpretation of the WQS which is often controversial. The federal 401 program allows the State to assess how a proposed project might affect flow and WQS. LURC- no allocation priority.
NH	State has no surface water allocation program. Water use is conducted under common law riparian rights: surface water can be used at will unless a downstream user wins a court settlement by showing their own use is impaired by an upstream user. The legislature has granted water rights to some users. Registration and reporting is required by regulation (Env-Ws 700) for water users above 140,000 gallons per week. Water quality certifications as part of wetlands permits are granted based on BPJ and follow ABF generally, but are negotiated in some cases, usually where habitat studies are conducted. These are only required where construction in wetlands is needed, that is, if you want to stick a hose in the river without needing a wetlands permit there is no limitation. Permanent facilities or structures would require wetlands permits and water quality certifications. Basically, under ABF policy, flow is expected to be maintained above the median flow of the lowest flow month of the year (August) with a default value of 0.5 cfs/m for basins > 50 square miles. The state's allocation program for groundwater is regulated riparianism for new water users, and riparian for grandfathered water users. The Watershed Management Bureau has no priority system. Water Quality Standards have narrative requirements that have been interpreted by the Department in context of ABF generally as protective of these flow levels. Existing flows above these amounts are not affected. There is no hierarchy of water users in NH, however, SB 410 proposes to establish a legislative committee to study this issue.
RI	State Guide Plan Elements are developed with state and local people as a guide; but the local communities through their boards, commissions, and councils direct growth. Through the WRB's WSSMP program, it is coupling these plans together with the Comprehensive Community Plans for each city and town. Through State Guide Plan Element 721, which RIWWA toiled on for two years with agencies, water supply for people is listed as the top priority.
VT	

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4. Permitting Withdrawals

Permitting withdrawals has been a controversial issue in some states, with water suppliers complaining that they are unable to supply customers because of permitting delays or restrictions. States were asked how they handled permitting of increased withdrawals in the first question. The second question on “Severe Lack of Supply” addresses how the state deals with water supply shortages that potentially threaten public health. This relates to suppliers who are concerned that their supplies have no margin of safety yet they are not allowed to withdraw more or find new sources. The remaining questions seek to understand whether systems have been denied withdrawals due to low streamflows, and how difficult and costly it may be to obtain new sources. The final two questions relate to protection of high yield aquifers and whether states have tried to assist water suppliers by “reserving” these supplies for future public use through protection or other measures.

CT	<p><u>Increased Withdrawals.</u> Water suppliers apply for permit meeting obligations of the Water Diversion Policy Act.</p> <p><u>Severe Lack of Supply.</u> For enforcement purposes, the water supplier receives a notification of violation as set forth by the CT Public Health Code.</p> <p><u>Withdrawal Denials Due to Low Streamflows.</u> Denials are not tracked for the specific reason of denial.</p> <p><u>Permitting Agency.</u> DPH, DEP, Dept. of Public Utility Control control existing or increased withdrawals.</p> <p><u>Permit Criteria.</u> Alternatives and conservation are considered in the permit process.</p> <p><u>Typical Time and Cost of Permit.</u> Timeline for a permit depends on completeness. Generally a long time due to insufficient staffing which was also identified in the Diversion 2000 Report. Typical permit: \$500-\$4,000 depending on withdrawal amount.</p> <p><u>Repermitting of Offline, Contaminated Wells.</u> For contaminated wells, only if current registration is to be exceeded do new approval requirements apply. Withdrawal permit would simply be maintained and no new permit is required for a new well located within 250’ of existing well.</p> <p><u>New Source Approvals.</u> DPH reviews well site and does sanitary inspection and evaluates all water quality results and any treatment for the site. DEP reviews all quantity removal based upon the Water Diversion Policy Act.</p> <p><u>State Water Supply Source Policies.</u> Overall State policy for growth, State Plan of Conservation and Development, but there is no policy for water supply source selection. Diversion 2000 Report identifies need for policy.</p> <p><u>Permit Volume.</u> >50,000 gpd for permit.</p> <p><u>Statewide Groundwater Availability Information.</u> Water suppliers primarily use the Stratified Drift Maps to identify potential sources.</p> <p><u>Is there state efforts to protect these areas.</u> If the area is not already used for drinking water then it is not protected. Areas of drinking water are protected by DPH through Wellhead protection and SWAP program. DPH – Gerald Iwan – through the Diversion Permit Review Process the protection of high yield areas are evaluated.</p>
MA	<p><u>Increased Withdrawals.</u> Water suppliers can increase withdrawals under emergency declarations (by DEP), allocations can be temporarily altered, especially if public health is being compromised. The permits under the WMA are for 20 years but are reviewed every 5 years. Demands are evaluated based on actual use and DEM projections and may be changed if it can be demonstrated that no detrimental environmental impacts will occur.</p>

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Severe Lack of Supply. An emergency declaration can be made to address the problem temporarily, but the town or water supplier is required to find a long term solution. The DEP may also authorize use of emergency sources that have not been approved for normal drinking water use. The WMA approval process also requires the development of an emergency response plan and a drought management plan. The water supplier must show the ability to meet the average day demand with its largest source off -line.

Withdrawal Denials Due to Low Streamflows. Approximately five denials occurred in the last five years including Holden (permit denied), Stoughton (WRC denial) and Gardner (safe yield issue). A permit is required for all year-around suppliers that withdrew 100,000 gallons per day on average over the year; seasonal users that withdraw 100,000 gallons per day on average for three consecutive months; and cranberry growers with 4.66 or more of unregistered acres in production. Water suppliers or users who obtain all their water from another water system (such as the MWRA) do not need a permit.

Permit Criteria. Permit conditions may include installation of meters, conservation activities, Zone II delineation of public surface supply wells or safe yield determinations for public surface water supplies, the implementation of wellhead protection measures for public supply wells, and withdrawal reductions during times of low stream flow. If no new source is involved in the allocation, only the WMA requirements are involved and the permit process takes approximately one year.

Typical Time and Cost of Permit. The regulatory minimum based on required turn-around with the WMA is 9 months. For new sources, the complete source approval process is involved (i.e. site screening etc.) and 3-5 years is commonly involved, according to MA DEP. (However, a number of water suppliers and consultants report that it is not uncommon for the process to take 5 to 10 years and cost hundreds of thousands of dollars.) The requirement of obtaining a minimum of eleven and one-half acres for Zone I can result in the cost of the new source being approximately one million dollars (naturally the cost of the land is highly variable). All new and existing sources that withdraw 100,000 gallons per day on average must use new source approval.

Repermitting of Offline, Contaminated Wells. A modified source approval process is utilized without the need for pumping test of WMA requirements. However, water quality monitoring is required.

New Source Approvals. See question 7. No state policy. The Aquifer Land Acquisition (ALA) program provides funds to purchase land of medium and high yielding aquifers. The USGS maps the aquifers in the state. (I need to talk with Mark Smith at WRC about Executive Order 385 with respect to growth management.)

Permit Volume. Equal to or greater than 100,000 gallons per day.

Application Approvals/Denials. There were few denials by DEP related to quantity or quality issues; the environmental issues were the stumbling blocks for the applicants. New source approval applications were 70-80 (per year?) in the late 1980s and 10-15 in year 2000. Certainly the regulatory requirements are continually becoming more restrictive, but also all the good sites are gone, public awareness is more keen, and costs are high.

Statewide Groundwater Availability Information. The USGS has evaluated and mapped ground water aquifers throughout the state. The WRC is undertaking a water assets study to pull together information on water resources throughout the state.

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	<p><u>Is there state efforts to protect these areas.</u> Towns usually have done studies within the town, have data on available sources, and have mapped aquifers and surface waters. The state ALA program utilizes the data to help prioritize purchases of land. Outside of the ALA program, the state has no program to help water suppliers or towns identify and protect high yield sources.</p>
ME	<p><u>Increased Withdrawals.</u> Water suppliers may increase withdrawals to meet demands under any conditions.</p> <p><u>Permitting Agency.</u> DEP reviews withdrawals for compliance with the Natural Resources Protection Act. The Land Use Regulation Commission (LURC) has jurisdiction over unorganized territories (areas with no towns, therefore no public water systems) and permits water withdrawals for mostly agricultural and some industrial withdrawals.</p> <p><u>Permit Criteria.</u> LURC-primary factors considered for permits have been potential impacts to stream flows, fishery resources and wetlands.</p> <p><u>Typical Time and Cost of Permit.</u> LURC – Permit timeline varies, in general, 3-6 months for first time, complex, or controversial applications, with shorter times for smaller, less complex, non-controversial projects or renewals.</p> <p><u>Repermitting of Offline, Contaminated Wells.</u> Reactivation of existing source would not require a permit, just testing to ensure safety.</p> <p><u>New Source Approvals.</u> DEP will only get involved depending on size (i.e. if Site Location Law is triggered), reviewing withdrawals for compliance with the Natural Resources Protection Act; DHS has not had a new surface water system request in years, they do issue approvals for groundwater systems but do not address withdrawal quantity other than to make sure that delineations and source protection align with expected demand. Other entities responsible for new source approvals include the Manufactured Housing Board, and Eating and Lodging within DHS.</p> <p><u>State Water Supply Source Policies.</u> No State policy yet; there is a Statewide Comprehensive Planning Law that will require a Statewide Plan in the future.</p> <p><u>Application Approvals/Denials.</u> Between 24-36 applications, some of these were surface waters switching to groundwater and some were expansions. Rate of approval neither increased or decreased in the last 5 years.</p> <p><u>Statewide Groundwater Availability Information.</u> No Statewide evaluation yet. A Withdrawal Task Force has been initiated and one of the first recommendations was to conduct a basin by basin inventory of availability. Not yet completed but will probably be integrated with statewide comprehensive plan in some fashion.</p> <p><u>Is there state efforts to protect these areas.</u> The only state-wide protection is a recent law prohibiting new USTs in wellhead protection areas and, under pending regulations, in high yield sand and gravel aquifers. Otherwise, the only protective regulations would be as a result of local zoning.</p>
NH	<p><u>Increased Withdrawals.</u> No restrictions have been placed on water suppliers other than UNH/Durham at this time. Wells established after the adoption of well siting regulations can not exceed the permitted production volume issued at the time the well was approved. However, the State only collects monthly water use data, so a well may exceed the permitted production volume for several days a month, but the State would have no way of knowing this because only monthly water use is reported.</p> <p><u>Severe Lack of Supply.</u> Supply shortages that are seasonal are addressed by administrative enforcement. DES issues orders</p>

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to provide new water sources, storage, or conservation measures. DES has issued moratoria on hook-ups to systems with such problems if they are not addressed.

Withdrawal Denials Due to Low Streamflows. Nothing as far as river regulation goes. There may be safety or health issues regulated elsewhere. There were no denials based on low streamflows through the WMB. Permit conditions are based on streamflow, but denial of use is not an option under riparian rights.

Permitting Agency. NHDES Water Supply Engineering Bureau regulates groundwater withdrawals. Wetlands and Watershed Management Bureaus review permit applications if a wetlands issue is involved.

Permit Criteria. The criteria for Surface withdrawals: Stream flow, planned water use amount as described by applicant, species present. For new groundwater withdrawals: water quality, impacts to existing water users or environmental resources.

Typical Time and Cost of Permit. Permits for groundwater withdrawals generally take 3-12 months. For large groundwater withdrawals, permits generally run \$10-60k not including well construction or land acquisition costs.

Repermitting of Offline, Contaminated Wells. For withdrawals that have been permitted under the State's Drinking Water Act or Groundwater Protection Act, the withdrawals must be re-permitted to increase withdrawals. No regulation of older, grandfathered withdrawals occurs, even if withdrawals are increased. Contaminated wells are re-permitted through process for approval of treatment.

New Source Approvals. For all new large groundwater withdrawals (>57,600 gallons over any 24-hour period) a water user must develop a preliminary application, develop a conservation plan, conduct a public hearing, conduct withdrawal testing, and submit a final report. The purpose of this process is to identify all existing water users and resources that could be impacted by a proposed large withdrawal, and ensure appropriate mitigation measures are in place to prevent adverse impacts from occurring. Public water suppliers must ensure that a new drinking water source yields safe drinking water. This is accomplished by ensuring source water protection measures are implemented, that potential contaminant sources within the zone of contribution are identified and assessed, and that appropriate water quality testing and pump testing are conducted.

State Water Supply Source Policies. There is no overall state policy guiding growth or water supply source selection, however SB 410, currently being considered by the State Legislature would study the concept of requiring an entity to develop "the least impacting alternative." The Office of State Planning and DES are also working on programs to discourage sprawl.

Permit Volume. For groundwater, all community water systems need a permit. Any non-water supply withdrawal that exceeds 57,600 gallons over any 24 hour period needs one.

Application Approvals/Denials. Approximately 20 applications. All had minor modifications. One entity, a golf course had significant limitations placed on the withdrawal permit. A water budget of the region approached a deficit scenario, and there were a large number of existing water users, environmental resources, and large community wells that could be potentially impacted by the withdrawal. The permit contains several trigger levels that require the golf course to reduce withdrawals when drought conditions exist or when certain environmental measurements indicate the potential for adverse

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	<p>impacts to occur.</p> <p><u>Statewide Groundwater Availability Information.</u> The Department and USGS have quantified water availability state-wide in stratified drift aquifers, and have completed a state-wide bedrock water resource study. DES also provides a GIS-based Favorable Gravel Well Analysis to towns upon request. Currently, the Department and USGS are creating a USGS “point and click” tool to quantify seasonal low flows for all NH streams, and to estimate recharge to any size sub-basin in NH.</p> <p><u>Is there state efforts to protect these areas.</u> The Department’s studies are often the basis for identifying locations for and developing new sources of water. State law allows for towns to adopt aquifer protection ordinances to preserve aquifers.</p>
RI	<p><u>Increased Withdrawals.</u> The WRB has had authority for existing and new water sources for public water suppliers since 1967. It is developing the meaning of its new authority over all withdrawals of all entities. The Board has chosen not to exercise its long standing authority over water suppliers, unless there existed competition between two or more suppliers, then it stepped in.</p> <p><u>Severe Lack of Supply.</u> Exceedances of safety factors are being deliberated by the Water Resources Board as part of their legislative mandate. State Guide Plan Policies will be the guiding element to include agriculture, economic development, environment, and others.</p> <p><u>Permitting Agency.</u> RIWRB will develop the meaning of its authority (could be regulatory, adjudicatory, registration, etc.). It is being developed. The WRB has existing authority over municipal water suppliers.</p> <p><u>Permit Criteria.</u> Factors considered in the permit process are being deliberated by the Water Resources Board as part of their legislative mandate. State Guide Plan Policies will be the guiding element to include agriculture, economic development, environment, and others. Passive approach to water suppliers, except when competition between suppliers.</p> <p><u>Typical Time and Cost of Permit.</u> Timeline: 1-2 months.</p>
VT	

5. Storage & Transfer Policies

<p>Water allocation is all about peak demands in the summer, which unfortunately occurs just when streams are at their most vulnerable and least available. Water suppliers for years have used reservoir storage to address this issue, by flood skimming or otherwise trapping surface waters during high spring or winter flows for later use during the summer. Many supplies are built on dammed streams. This technique can provide a valuable tool, but these reservoirs cannot have the same habitat value as natural streams due to their large water level fluctuation. These storage reservoirs may require periodic dredging and offline reservoirs (which tend to have the least environmental impact on wetlands) may involve water diversions. Therefore we asked states about their policies on new storage reservoirs; dredging; and interbasin transfer. We also asked about dam removal programs, since presumably some storage reservoirs could be threatened by dam removals for anadromous fish passage.</p>	
CT	<p><u>State Policy on New Reservoirs.</u> Views storage reservoirs favorably (as identified in Diversion 2000 Report) since they provide storage during low flow times although some conflict exists between policy and obtaining dam approval from the Federal Agencies. One application for a new reservoir is currently pending, no new reservoirs have been built, only modifications to existing reservoirs.</p> <p><u>Dredging.</u> Dredging is permissible, not sure how many have been dredged.</p>

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	<p><u>Dam Removals</u>. There is a state initiative to remove dams, 5 were removed in 2001 and 5 are scheduled for this year.</p> <p><u>Interbasin Transfer</u>. Diversion Policy Act regulates transfers. Not sure how many have occurred in last 10 years.</p>
MA	<p><u>State Policy on New Reservoirs</u>. The development of new storage reservoirs must follow the source development policy outlined in Chapter 3 of the DEP Guideline for Public Water Supplies. In Rockport, the Flat Ledge Quarry is under development, the Klondike Quarry in Gloucester and an old mill pond in Newburyport are the only reservoirs built in the last 10 years.</p> <p><u>Dredging</u>. There is one ongoing permitted dredging project in Massachusetts (Tri-Town Water Board, Braintree, Randolph and Holbrook). The Metropolitan District Commission (MDC) also installed barrier curtains in the forebay of two tributary streams into Wachusett Reservoir (a water supply reservoir) to allow sediment to settle before the water enters the main body of the reservoir. The settled sediment is periodically dredged.</p> <p><u>Dam Removals</u>. There is a specific program in MA for dam removal through the MA EOEa Riverways Office called the River Restore Program.</p> <p><u>Interbasin Transfer</u>. The Interbasin Transfer Act regulates the transfer of water into and out of watershed basins.</p>
ME	<p><u>State Policy on New Reservoirs</u>. In 1997 an irrigation pond task force was formed to streamline the Section 404 permitting process for pond construction. Led by NRCS, the task force includes reps from state & fed regulatory agencies and the agricultural community. It has produced guidance documents for pond permitting and development of farm irrigation water management plans. Subsequently, the state Sustainable Water Withdrawal Policy Workgroup was charged with making recommendations to the ME Land & Water Resources Council on instream flow standards to protect aquatic habitat and improved storage options, including ponds, as an alternative to direct withdrawals. There is considerable overlap in membership and interests of the two groups. EPA and others are working to integrate the groups to reach agreement on BMPs/standards for filling ponds and protecting aquatic ecosystems.</p> <p>No new reservoirs have been built in Maine.</p> <p><u>Dredging</u>. Dredging permissible under DEP jurisdiction, a NEPA review is required. None in last 10 years.</p> <p><u>Dam Removals</u>. No formal program for dam removal, but several have been removed as a result of the FERC licensing process.</p> <p><u>Interbasin Transfer</u>. No regulations, although the Geological Survey in conjunction with DHS administers a law which prevents the trucking of more than 10 gallons of water across town lines without a bulk water transport permit.</p>
NH	<p><u>State Policy on New Reservoirs</u>. Watershed Management is encouraging storage facilities. There is still some question as to the best timing and method for filling. Dam bureau is involved in any impoundment reservoir. Preliminary discussions are underway between NHDES and the Town of Durham regarding possible changes in the operation of the water supply system which would allow higher flow water transfer from the Lamprey River to recharge an aquifer which would then be used during lower river flow/higher water demand periods. However, there have been no new reservoirs in the last 10</p>

Water Allocation Matrix

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	<p>years.</p> <p><u>Dredging</u>. Dredging of reservoirs is done routinely at some water supplies with run-of-the-river reservoirs (e.g., Berlin, Troy, Pittsfield). This activity has not required a permit.</p> <p><u>Dam Removals</u>. The State does have a program to remove inactive dams.</p> <p><u>Interbasin Transfer</u>. State statute RSA 483 prohibits interbasin transfer and defines a basin as one of the five major basins in the state. Example- 1 Connecticut. River, 2 Androscoggin, 3 Merrimack/Winnepesaukee/Pemigewasset etc. There are also laws that prohibit new interbasin transfers from “designated” river reaches.</p>
RI	<p><u>State Policy on New Reservoirs</u>. WRB retains that authority as directed by Governor and Legislature.</p> <p>There have been no new reservoirs in the last 10 years.</p> <p><u>Dredging</u>. Dredging permissible. None dredged in last 10 years.</p> <p><u>Dam Removals</u>. No program to remove dams, but to survey and improve. One dam that recently fell is being replaced.</p> <p>DEM retains the inspection authority.</p> <p><u>Interbasin Transfer</u>. No regulations</p>
VT	<p><u>Dam Removals</u>. The Vermont Dam Task Force is a statewide group of government and non-government organizations which is examining dam removal in VT.</p>

6. Conservation & Droughts

CT	<p><u>Standards</u>. Conservation Plans must be submitted with permit applications.</p> <p><u>Industrial Water Conservation Standards& Enforcement</u>. Industrial water conservation measures are to be addressed within the water conservation section of the Water Supply Plans. Water companies enforce standards.</p> <p><u>Customer metering</u>. Meters are not required, although there has been some discussion of it.</p> <p><u>Annual reports and master meter calibration</u>. Water production reports are to be submitted monthly. No specific requirement for calibration.</p> <p><u>Do Drought Emergencies Affect Allocations</u>: Yes, drought emergencies affect allocations for non-essential water uses. PWS have to comply with streamflow triggers as set forth in their permit. If there are no environmental issues then a PWS would be unaffected. DPH: No specific policy has been established, CT does not have a specific definition of a drought emergency.</p>
MA	<p><u>Standards</u>. Water conservation standards exist.</p> <p><u>Do they emphasize Outside Watering</u>. They do not emphasize outside watering, however, the water resources commission has recently developed a new guideline on outdoor water use.</p> <p><u>Industrial Water Conservation Standards& Enforcement</u>. The WMA requires the same conservation for both public and industrial users with industry indicating the levels of potential conservation for their particular operations. DEP enforces.</p> <p><u>Customer metering</u>. Individual metering required for all suppliers over 100,000 gallons per day with both individual and master meters being regulated.</p>

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	<p><u>Annual reports and master meter calibration.</u> Annual reports are required with monthly break-outs for the larger suppliers.</p> <p><u>Do Drought Emergencies Affect Allocations.</u> The Massachusetts Drought Management Task Force has developed a plan that addresses the long-term issues of allocations during drought conditions. The WMA requires the water supplier have a procedure for declaring a public water supply emergency and DEP can issue an emergency declaration allowing use of unregistered source waters and supply by MWRA without the requirement of Interbasin Transfer approval.</p>
ME	<p><u>Standards.</u> LURC - No specific standards, however, as part of the application the water user is required to submit a farm irrigation plan, including provisions for water conservation.</p> <p><u>Industrial Water Conservation Standards& Enforcement.</u> No industrial water conservation standards.</p> <p><u>Customer metering.</u> If Rural Utility Service (RUS) funds a water project, they require metering.</p> <p><u>Annual reports and master meter calibration.</u> Only master meter readings require monthly/annual reports. Public Utilities Commission regulates some systems and requires reporting of unaccounted for water. No requirement for calibration.</p>
NH	<p><u>Are there Standards.</u> There are conservation requirements for new large groundwater withdrawals. Also, currently, SB440 is being considered by the legislature, and if enacted would require that an entity develop best management practices for water conservation prior to the State approving a new groundwater or surface water source. DES also has proposed Instream Flow rules. A major element of river-specific Water Management Plans under the ISF rules would be a water conservation plan.</p> <p><u>Do they emphasize Outside Watering.</u> The best management practices would include watering.</p> <p><u>Industrial Water Conservation Standards & Enforcement.</u> For new large groundwater withdrawals, a new industrial water user has to demonstrate water use efficiency as part of obtaining the large groundwater withdrawal permit. If SB 440 is enacted, specific BMPs will be developed and enforced by DES.</p> <p><u>Customer metering.</u> Individual metering not required. Env-Ws 700 has some requirements for accuracy of metering or water use measurement.</p> <p><u>Annual reports and master meter calibration.</u> Registered water users ($\geq 140,000$ gal/week) are required to submit monthly and annual water use reports. State does not require master meter calibration, but water use must be reported within an accuracy of 5%, so by default calibration at least annually is required.</p> <p><u>Do Drought Emergencies Affect Allocations.</u> Large groundwater withdrawal permits issued after 1998 may contain conditions that reduce the permitted production volume of a well during times of drought. Furthermore the Governor can invoke emergency powers in response to a drought and presumably order reduction in withdrawals. There is a drought management plan. There is no surface water allocation program.</p>
RI	<p><u>Standards.</u> As developed in the WRB Rules & Procedures for WSSMP. All systems vary within the parameters of the WSSMP program rules.</p> <p><u>Do they emphasize Outside Watering.</u> Suppliers help guide users on wise-use of outside uses through their programs. The WRB, DOH, and RIWWA develop coordinated programs and promotions to this end. The WRB is commencing a new concerted Proactive Demand Management statewide program.</p>

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Industrial Water Conservation Standards& Enforcement. Industrial water conservation through combined water-sewer fee savings in recycling and reuse. The WRB will also move forward with a Statewide Gray Water Program. Water and sewer agencies work together with the businesses without getting into proprietary aspects of the businesses. Not enforcement-help.

VT Standards. The Vermont WQS effective July 2, 2000 contains a water conservation policy. It states, in part, that water conservation should be considered in all decisions.

7. Water Supplier Input

As the committee developed the matrix, we found a contrast among some states regarding the degree to which water suppliers are a part of the regulatory process. To understand this better, the Committee asked how states had involved them in the allocation and withdrawal process.

CT The State has developed a Water Planning Council which is composed of state agencies in which water companies participate. DEP, DPH, water company as applicant, notices sent to municipality and any member of the public can comment. Through Water Diversion Policy Act notices are sent to interested parties when a withdrawal is requested.

MA The DEP is the decision making agency for water withdrawals in Massachusetts but depends on input from other agencies including Fish and Wildlife, Natural Heritage, MEPA (and ENF is only required for new construction), Citizen and Environmental Advisory Groups, and the Division of Environmental Management (DEM). The Site Screening methodology was chosen after public review and input including review and comment by the NEWWA. All projects proposing water withdrawals include public meetings and comments with the impact of the withdrawals on stream flow being critical. In Massachusetts, public health is a primary consideration but the DEP attempts to balance all uses of the stream so water supply is one of several considerations. Water suppliers are active partners in the Site Screening process and later as part of the Public Review process. The Appeals process is available to the utility if a disagreeable decision is reached.

ME During the development of Water Quality Standards (WQS), statewide forums have been held that included water supplier participation.

NH Meetings with stakeholder groups including PWSs have been held to discuss rules concepts and results of Department drafts in light of these meetings. Public meetings have been held to present interim products and invite general comment. Parties present for decision-making depends on the applicant. Usually a proposal to withdraw is made to the department. They may choose to include consultants in the process. The Watershed Management Bureau comments on the Wetlands Bureau permit application and recommends conditions. For groundwater withdrawals, it is the general public, municipalities and public water suppliers within the sub watershed. The public may provide input during the permitting process, and DES must respond in writing to any recommendation that is not incorporated into our Final Decision on a permit. Any entity may challenge a Final Decision by DES and can use DES's written response as a basis for appeal. Suppliers can affect decision-making by supplying data supporting a conclusion that designated and existing uses are supported by the level of flow, but usually by legislative pressure on the agency. Water suppliers lobby the legislature through use of their own lobbyist and the New Hampshire Water Works.

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RI	Water suppliers are major players in the deliberations in the form of the WRB make-up as well as RIWWA monitoring. Water suppliers are integral through the Water Supply System Management Planning Program (WSSMP) with the WRB.
VT	